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मानक

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“जानने का अधिकार, जीने का अधिकार”

Mazdoor Kisan Shakti Sangathan

“The Right to Information, The Right to Live”

“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

IS 1248-7 (2003): Direct Acting Indicating Analogue Electrical Measuring Instruments and their Accessories, Part 7: Multi-Function Instruments [ETD 12: Measuring Equipment for Basic Electrical Quantities]



“ज्ञान से एक नये भारत का निर्माण”

Satyanarayan Gangaram Pitroda

“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

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भारतीय मानक
प्रत्यक्ष क्रियाशील सूचक अनुरूप वैद्युत मापन
उपकरण तथा उनके सहायक उपकरण
भाग 7 मल्टी-फंक्शन उपकरणों की विशेष अपेक्षाएँ
(तीसरा पुनरीक्षण)

Indian Standard

DIRECT ACTING INDICATING ANALOGUE
ELECTRICAL MEASURING INSTRUMENTS
AND THEIR ACCESSORIES

PART 7 SPECIAL REQUIREMENTS FOR MULTI-FUNCTION INSTRUMENTS

(Third Revision)

ICS 17.220.20

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BUREAU OF INDIAN STANDARDS
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FOREWORD

This Indian Standard (Part 7) (Third Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Measuring Equipment for Basic Electrical Quantities Sectional Committee had been approved by the Electrotechnical Division Council.

This standard covers the special requirements for multi-function instruments.

This standard was first published in 1958 and was revised in 1968 and 1983.

This standard is one of a series of nine Indian Standards on direct acting indicating analogue electrical measuring instruments and their accessories. The other standards are as follows:

- (Part 1) : 2003 Definitions and general requirements (*fourth revision*)
- (Part 2) : 2003 Special requirements for ammeters and voltmeters (*third revision*)
- (Part 3) : 2003 Special requirements for wattmeters and varmeters (*third revision*)
- (Part 4) : 2003 Special requirements for frequency meters (*third revision*)
- (Part 5) : 2003 Special requirements for phase meters, power factor meters and synchrosopes (*third revision*)
- (Part 6) : 2003 Special requirements for ohmmeters (impedance meters) and conductance meters (*third revision*)
- (Part 8) : 2003 Special requirements for accessories (*third revision*)
- (Part 9) : 2003 Test methods (*third revision*)

In preparation of this standard, assistance has been derived from IEC 60051-7 (1984) 'Direct acting indicating analogue electrical measuring instruments and their accessories: Part 7 Special requirements for multi-function instruments (fourth edition)', issued by the International Electrotechnical Commission (IEC).

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

DIRECT ACTING INDICATING ANALOGUE ELECTRICAL MEASURING INSTRUMENTS AND THEIR ACCESSORIES

PART 7 SPECIAL REQUIREMENTS FOR MULTI-FUNCTION INSTRUMENTS

(Third Revision)

1 SCOPE

1.1 This standard (Part 7) applies to multi-function analogue instruments as defined in 3.1.7 of IS 1248 (Part 1).

1.2 This Part also applies to non-interchangeable accessories [as defined in 3.1.15.3 of IS 1248 (Part 1)] used with multi-function analogue instruments.

For 1.3 to 1.8, see IS 1248 (Part 1).

2 REFERENCE

2.1 The following standard is a necessary adjunct to this standard:

<i>IS No.</i>	<i>Title</i>
1248 (Part 1) : 2003	Direct acting indicating analogue electrical measuring instruments and their accessories: Part 1 Definitions and general requirements (<i>fourth revision</i>)

3 DEFINITIONS

The provisions of 3 of IS 1248 (Part 1) shall apply.

4 DESCRIPTION, CLASSIFICATION AND COMPLIANCE

4.1 Description

Multi-function instruments shall be described in accordance with the quantities which they measure, for example, d.c./a.c. ammeter- d.c./a.c. voltmeter-ohmmeter.

4.2 Classification

4.2.1 Each function of a multi-function instrument shall be classified in one of the accuracy classes denoted by the class indices as given in 4.2 of IS 1248 relevant to that function.

4.2.2 Each function may have a different class index. d.c. and a.c. are considered to be different measuring functions as are the measurement of current and voltage.

4.2.3 Some ranges of a function may have a different class index from the other ranges.

4.3 Compliance with the Requirements of this Standard

For 4.3.1 and 4.3.2, see IS 1248 (Part 1).

4.3.3 The special requirements of the relevant parts 2 to 6 apply to the various functions of a multi-function instrument.

5 REFERENCE CONDITIONS AND INTRINSIC ERRORS

5.1 Reference Conditions

See IS 1248 (Part 1) for general requirements and 5.1 in the relevant part for each function for special requirements, if any.

5.2 Limits of Intrinsic Error, Fiducial Value

See IS 1248 (Part 1) for general requirements and 5.2 in the relevant part for each function for special requirements, if any.

5.2.1 Correspondence Between Intrinsic Error and Accuracy Class

See IS 1248 (Part 1) for general requirements and 5.2.1 in the relevant part for each function for special requirements, if any.

5.2.2 Fiducial Value

The fiducial value for each function of a multi-function instrument shall be as given in 5.2.2 of the part relevant to that function.

6 NOMINAL RANGE OF USE AND VARIATIONS

6.1 Nominal Range of Use

See IS 1248 (Part 1) and Table 2 of the parts relevant to each function.

6.2 Limits of Variations

See IS 1248 (Part 1) for general requirements and 6.2 of the relevant parts for each function for special requirements, if any.

6.3 Conditions for the Determination of Variations

See IS 1248 (Part 1) for general requirements and 6.3 of the relevant parts for each function for special requirements, if any.

7 FURTHER ELECTRICAL AND MECHANICAL REQUIREMENTS

7.1 Voltage Tests, Insulation Tests and Other Safety Requirements

See IS 1248 (Part 1).

7.2 Damping

See IS 1248 (Part 1) for general requirements and 7.2 of the relevant parts for each function for special requirements, if any.

However, if a multi-function instrument cannot meet all of the requirements of 7.2 of IS 1248 (Part 1) on one or more ranges, the manufacturer shall mark Symbol F-33 [see Table 3 of IS 1248 (Part 1)] on the dial or on a part which is visible while the instrument is in use and shall give details in a separate document of the requirements which cannot be met.

7.3 Self-Heating

See IS 1248 (Part 1) for general requirements and 7.3 of the relevant parts for each function for special requirements, if any.

However, if a multi-function instrument cannot meet all of the requirements of 7.3 of IS 1248 (Part 1) on one or more ranges, the manufacturer shall mark symbol F-33 [see Table 3 of IS 1248 (Part 1)] on the dial or on a part which is visible while the instrument is in use and shall give details in a separate document of the requirements which cannot be met.

7.4 Permissible Overloads

See IS 1248 (Part 1) for general requirements and 7.4 of the relevant parts for each function for special requirements, if any.

However, if a multi-function instrument cannot meet all of the requirements of 6.5 of IS 1248 (Part 1) on one or more ranges, the manufacturer shall mark symbol F-33 [see Table 3 of IS 1248 (Part 1)] on the dial or on a part which is visible while the instrument

is in use and shall give details in a separate document of the requirements which cannot be met.

7.5 Limiting Values of Temperature

See IS 1248 (Part 1).

7.6 Deviation from Zero

Special requirements and tests for deviation from zero and for return to zero are given in 7.6 of the parts relevant to each function.

8 CONSTRUCTION REQUIREMENTS

For 8.1 and 8.2, see IS 1248 (Part 1).

8.3 Preferred Values

Special requirements concerning preferred values are given in 8.3 of the part relevant to each function.

8.4 Adjuster(s), Mechanical and/or Electrical

See IS 1248 (Part 1).

9 INFORMATION, GENERAL MARKINGS AND SYMBOLS

9.1 Information

See IS 1248 (Part 1). However, if it is impractical to mark on the dial all of the information that is required by 9.2.1 and 9.2.2 of IS 1248 (Part 1), the manufacturer shall mark symbol F-33 [see Table 3 of IS 1248 (Part 1)] on the dial or on a part which is visible while the instrument is in use and shall give in a separate document the information which is not marked.

10 MARKINGS AND SYMBOLS FOR TERMINALS

[For 10.1 to 10.3, see IS 1248 (Part 1)].

10.4 Special Markings for Terminals

10.4.1 Terminals shall be clearly marked to show their function and/or range.

10.4.2 If a terminal is used as the positive terminal of a d.c. current or voltage measuring function, either it shall be marked using symbol F-46 (+) given in Table 3 of IS 1248 (Part 1), or the terminal and/or its immediate surround shall be coloured red. This requirement applies no matter what its use may be with any other function.

11 TESTS TO PROVE COMPLIANCE WITH THIS STANDARD

See IS 1248 (Part 1).

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Amendments Issued Since Publication

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